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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,474	04/13/2004	Masamichi Saito	9281-4798	4590

7590 10/20/2008

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EXAMINER	
RENNER, CRAIG A	
ART UNIT	PAPER NUMBER
2627	
MAIL DATE	DELIVERY MODE
10/20/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/823,474	SAITO ET AL.	
	Examiner	Art Unit	
	Craig A. Renner	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 March 2008 & 12 June 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *4-6 and 12-14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,7-11 and 15-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Claims 4-6 and 12-14 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to one or more non-elected inventions/species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 29 November 2006.

Terminal Disclaimer

2. The terminal disclaimer filed on 19 March 2008 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration dates of U.S. Patent No. 7,220,499 and U.S. Patent No. 7,327,539 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-3, 7-11 and 15-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. In lines 17 and 18 of claim 1, lines 2 and 4 of claim 2, and lines 5 and 6 of claim 7, it is indefinite as to whether each instance of "the pinned magnetic layer" refers to that set forth in line 6 of independent claim 1 or one of those set forth in line 15 of independent claim 1.

b. In line 19 of claim 1, "the track width direction" is indefinite because it lacks clear and/or positive antecedent basis.

c. In lines 3-5 of claim 8, it is indefinite as to how the film can comprise "Ta/Cu" or "Ta/Ru/Cu" "wherein the composition contains Cr" since neither "Ta/Cu" nor "Ta/Ru/Cu" contain Cr.

d. In lines 16-17 and 18-19 of claim 9, line 2 of claim 10, and lines 5 and 6 of claim 15, it is indefinite as to whether each instance of "the pinned magnetic layer" refers to that set forth in line 6 of independent claim 9 or one of those set forth in line 15 of independent claim 9.

e. In lines 14 and 15 of claim 17, and lines 2 and 4 of claim 19, it is indefinite as to whether each instance of "the pinned magnetic layer" refers to that set forth in line 6 of independent claim 17 or one of those set forth in line 9 of independent claim 17.

f. Claims 3, 11, 16, 18 and 20 inherit the indefiniteness associated with their respective base claims and stand rejected as well.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 2, 7, 9, 10, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakatani et al. (US 5,390,061) in view of Coffey et al. (US 5,583,725), for instance.

Nakatani et al. (US 5,390,061) teaches a CPP giant magnetoresistive head comprising lower and upper shield layers (15 and 16, for instance) with a predetermined shield distance therebetween (as shown in FIG. 10, for instance); and a giant magnetoresistive element disposed between the upper and lower shield layers (as shown in FIG. 10, for instance), the giant magnetoresistive element having a group of adjacent parallel layers (includes layers 2, 3 and 4, for instance), the group comprising a pinned magnetic layer (2, see lines 13-16 in column 9, for instance, i.e., the larger coercive force of layer 2 results in layer 2 being pinned to at least some extent), a free magnetic layer (4) and a nonmagnetic layer (3) disposed between the pinned magnetic layer and the free magnetic layer (as shown in FIG. 1, for instance), the CPP giant magnetoresistive head being free of an antiferromagnetic layer between the upper and lower shield layers that passes generally perpendicularly through a vertical plane drawn through the group of adjacent parallel layers in a thickness direction (as shown in FIG.

1, for instance), wherein a current flows in a direction of the vertical plane (as shown in FIG. 1, for instance, i.e., due to the electrode arrangement), and wherein the pinned magnetic layer extends to a rear of the nonmagnetic layer and the free magnetic layer in a height direction (as shown in FIG. 1, for instance), and a dimension of the pinned magnetic layer in a height direction is larger than that in a track width direction (as shown in FIG. 1, for instance) [as per claim 1]; wherein the pinned magnetic layer comprises a magnetic material having a positive magnetostriction constant or a magnetic material having high coercive force (lines 13-16 in column 9, for instance, i.e., a magnetic material having high coercive force), and an end of the pinned magnetic layer is exposed at a surface facing a recording medium (as shown in FIG. 1, for instance) [as per claims 2, 9 and 10]; and wherein the head further comprises large-area nonmagnetic metal films (1 and 6) provided between the giant magnetoresistive element and the lower shield layer and between the giant magnetoresistive element and the upper shield layer, respectively (as shown in FIG. 1 relative to FIG. 10, for instance), so that the large-area nonmagnetic metal films are in direct contact with the pinned magnetic layer and the free magnetic layer (as shown in FIG. 1, for instance) and have larger areas than those of the pinned magnetic layer and the free magnetic layer, respectively (as shown in FIG. 1, for instance) [as per claims 7 and 15]. Nakatani et al. (US 5,390,061), however, remains silent as to the pinned magnetic layer including a "laminated ferrimagnetic structure comprising a first pinned magnetic layer and a second pinned magnetic layer which are laminated with a nonmagnetic intermediate layer disposed therebetween."

Coffey et al. (US 5,583,725), for instance, shows that a laminated ferrimagnetic structure (70) comprising a first pinned magnetic layer (72) and a second pinned magnetic layer (74) which are laminated with a nonmagnetic intermediate layer (73) disposed therebetween is a notoriously old and well known pinned magnetic layer configuration in the art. The incorporation of Coffey et al. (US 5,583,725) in this rejection does not constitute a new grounds of rejection as it is merely cited in support of the examiner's taking of Official notice of "the fact that a laminated ferrimagnetic structure comprising a first pinned magnetic layer and a second pinned magnetic layer which are laminated with a nonmagnetic intermediate layer disposed therebetween is a notoriously old and well known pinned magnetic layer configuration in the art." It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have had the pinned magnetic layer of Nakatani et al. (US 5,390,061) have a laminated ferrimagnetic structure comprising a first pinned magnetic layer and a second pinned magnetic layer which are laminated with a nonmagnetic intermediate layer disposed therebetween as shown by Coffey et al. (US 5,583,725), for instance. The rationale is as follows:

One of ordinary skill in the art would have been motivated to have had the pinned magnetic layer of Nakatani et al. (US 5,390,061) have a laminated ferrimagnetic structure comprising a first pinned magnetic layer and a second pinned magnetic layer which are laminated with a nonmagnetic intermediate layer disposed therebetween as shown by Coffey et al. (US 5,583,725), for instance, since such is a notoriously old and well known pinned magnetic layer configuration in the art, and since selecting a known

pinned magnetic layer configuration on the basis of its suitability for the intended use is considered to be within the level of ordinary skill in the art.

7. Claims 3 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakatani et al. (US 5,390,061) in view of Coffey et al. (US 5,583,725) as applied to claims 1 and 9 above, and further in view of Inomata et al. (US 6,381,171), for instance.

Nakatani et al. (US 5,390,061) in view of Coffey et al. (US 5,583,725) teach the head as detailed in paragraph 6, supra. Nakatani et al. (US 5,390,061) in view of Coffey et al. (US 5,583,725), however, remain silent as to "wherein the first and second pinned magnetic layers partially or entirely comprise Fe-Co-Cu (wherein Fe > 10 atomic percent, Co > 30 atomic percent, and Cu > 5 atomic percent), Fe-Co-Cu-X (wherein X is at least one element of Pt, Pd, Mn, Si, Au, and Ag), or Co_2MnY (wherein Y is at least one element of Ge, Si, Sn, and Al)."

Inomata et al. (US 6,381,171), for instance, shows that at least one of Fe-Co-Cu (wherein Fe > 10 atomic percent, Co > 30 atomic percent, and Cu > 5 atomic percent), Fe-Co-Cu-X (wherein X is at least one element of Pt, Pd, Mn, Si, Au, and Ag), and Co_2MnY (wherein Y is at least one element of Ge, Si, Sn, and Al) is a notoriously old and well known pinned magnetic layer material in the art (line 66 in column 13 thru line 5 in column 14 taken in conjunction with line 42 in column 10, for instance, i.e. pinned magnetic layer 1 may be made of "Co_2MnGe," for instance). The incorporation of Inomata et al. (US 6,381,171) in this rejection does not constitute a new grounds of rejection as it is merely cited in support of the examiner's taking of Official notice of "the

fact that at least one of Fe-Co-Cu (wherein Fe > 10 atomic percent, Co > 30 atomic percent, and Cu > 5 atomic percent), Fe-Co-Cu-X (wherein X is at least one element of Pt, Pd, Mn, Si, Au, and Ag), and Co_2MnY (wherein Y is at least one element of Ge, Si, Sn, and Al) is a notoriously old and well known pinned magnetic layer material in the art." It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have had the first and second pinned magnetic layers of Nakatani et al. (US 5,390,061) in view of Coffey et al. (US 5,583,725) partially or entirely comprise Co_2MnGe, for instance, as shown by Inomata et al. (US 6,381,171), for instance. The rationale is as follows:

One of ordinary skill in the art would have been motivated to have had the first and second pinned magnetic layers of Nakatani et al. (US 5,390,061) in view of Coffey et al. (US 5,583,725) partially or entirely comprise Co_2MnGe, for instance, as shown by Inomata et al. (US 6,381,171), for instance, since such is a notoriously old and well known pinned magnetic layer material in the art as shown by Inomata et al. (US 6,381,171), for instance, and since selecting a known material on the basis of its suitability for the intended use is within the level of ordinary skill in the art, *In re Leshin*, 125 USPQ 416 (CCPA 1960).

8. Claims 8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakatani et al. (US 5,390,061) in view of Coffey et al. (US 5,583,725) as applied to claims 1 and 9 above, and further in view of Hasegawa et al. (US 2002/0135956), for instance.

Nakatani et al. (US 5,390,061) in view of Coffey et al. (US 5,583,725) teach the head as detailed in paragraph 6, supra. Nakatani et al. (US 5,390,061), however, further remains silent as to "wherein the large-area nonmagnetic metal film disposed between the giant magnetoresistive element and the lower shield layer comprises any one of Ta/Cu, Ta/Ru/Cu, Ta/Cr, Ta/Ni-Cr, Ta/(Ni-Fe)-Cr, and Cr, and when the composition contains Cr, the Cr content exceeds 20 atomic percent."

Nakatani et al. (US 5,390,061) does, however, teach that the large-area nonmagnetic metal film disposed between the giant magnetoresistive element and the lower shield layer is an electrode. Hasegawa et al. (US 2002/0135956), for instance, shows that at least one of Ta/Cu, Ta/Ru/Cu, Ta/Cr(>20 at%), Ta/Ni-Cr(>20 at%), Ta/(Ni-Fe)-Cr(>20 at%), and Cr is a notoriously old and well known electrode material in the art (paragraph [0071], for instance, i.e., "Cr," for instance). The incorporation of Hasegawa et al. (US 2002/0135956) in this rejection does not constitute a new grounds of rejection as it is merely cited in support of the examiner's taking of Official notice of "the fact that at least one of Ta/Cu, Ta/Ru/Cu, Ta/Cr(>20 at%), Ta/Ni-Cr(>20 at%), Ta/(Ni-Fe)-Cr(>20 at%), and Cr is a notoriously old and well known electrode material in the art." It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have had the large-area nonmagnetic metal film disposed between the giant magnetoresistive element and the lower shield layer of Nakatani et al. (US 5,390,061) comprise Cr, for instance, as shown by Hasegawa et al. (US 2002/0135956), for instance. The rationale is as follows:

One of ordinary skill in the art would have been motivated to have had the large-area nonmagnetic metal film disposed between the giant magnetoresistive element and the lower shield layer of Nakatani et al. (US 5,390,061) comprise Cr, for instance, as shown by Hasegawa et al. (US 2002/0135956), for instance, since Nakatani et al. (US 5,390,061) teaches that the large-area nonmagnetic metal film disposed between the giant magnetoresistive element and the lower shield layer is an electrode, and Cr is a notoriously old and well known electrode material in the art as shown by Hasegawa et al. (US 2002/0135956), for instance, and since selecting a known material on the basis of its suitability for the intended use is within the level of ordinary skill in the art. See *In re Leshin*, supra.

Allowable Subject Matter

9. Claims 17-20 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

Response to Arguments

10. Applicant's arguments filed 12 June 2008 have been fully considered but they are not persuasive.

With respect to the rejection of claims under 35 U.S.C. 103(a) as being unpatentable over Nakatani et al. (US 5,390,061), the applicants "respectfully request that the Examiner provide factual support for the Official Notice." Applicants' attention is directed to Coffey et al. (US 5,583,725), Inomata et al. (US 6,381,171), and Hasegawa

et al. (US 2002/0135956) as applied in the rejections, supra, in support of the examiner's taking of Official notice. The incorporation of these references in the rejections, supra, does not constitute new grounds of rejection as they are merely cited in support of the examiner's taking of Official notice.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection (i.e., the rejections under 35 U.S.C. 112, second paragraph) presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig A. Renner whose telephone number is (571) 272-7580. The examiner can normally be reached on Tuesday-Friday 9:00 AM - 7:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, A. L. Wellington can be reached on (571) 272-4483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Craig A. Renner/
Primary Examiner, Art Unit 2627

CAR